

NAME:

DATE:

Unit-2 Mastery Assessment (version 614)

Question 1 (10 points)

Let f represent a function. If $f[32] = 13$, then there exists a knowable solution to the equation below.

$$y = 2 \cdot f[3x + 5] + 14$$

Find the solution.

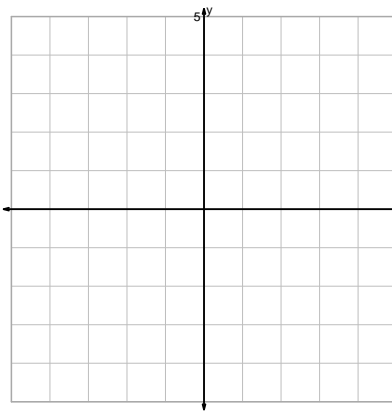
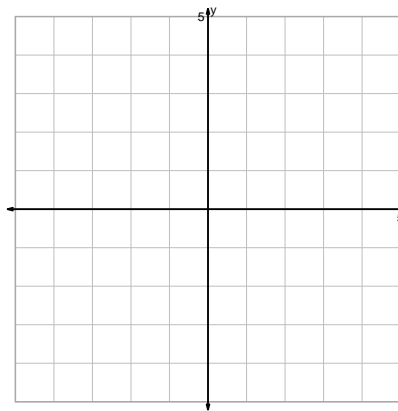
$$x =$$

$$y =$$

Question 2 (20 points)

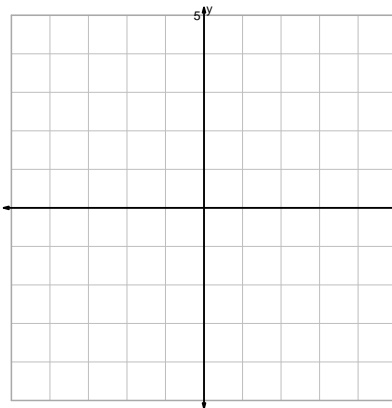
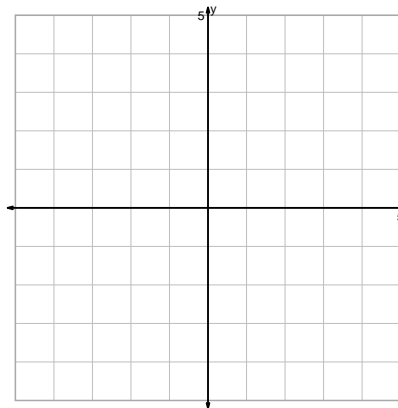
Graph the equations accurately. For each integer-integer point on the parent, indicate the corresponding point precisely. Also, with dashed lines, indicate any asymptotes.

$$y = 2^{2x}$$



$$y = \sqrt{-x}$$

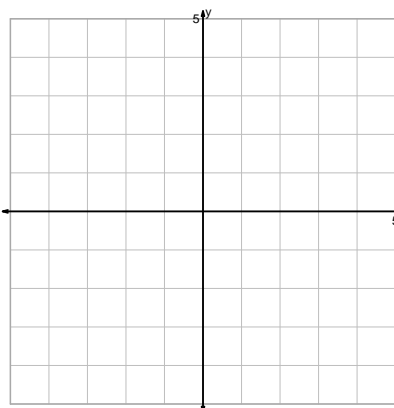
$$y = (x - 2)^3$$



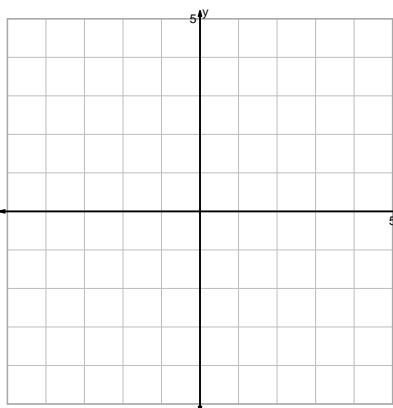
$$y = -2^x$$

Question 2 continued...

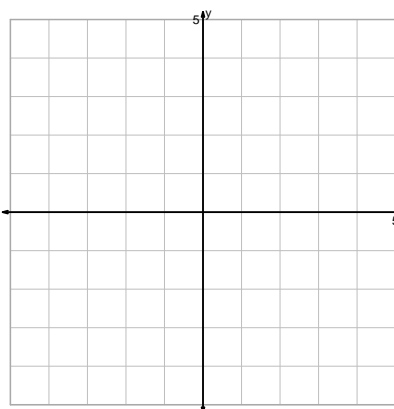
$$y = \sqrt[3]{x} - 2$$



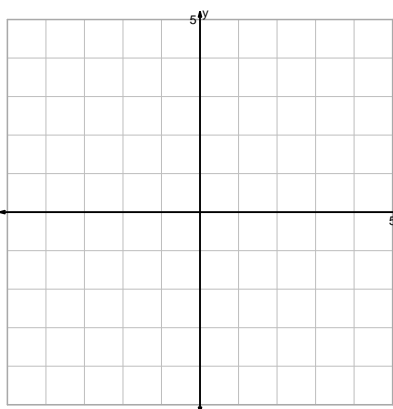
$$y = \left(\frac{x}{2}\right)^3$$



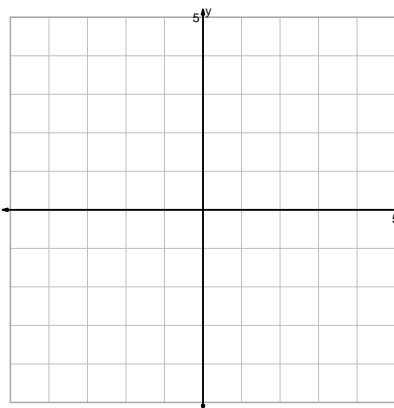
$$y = 2 \cdot \sqrt[3]{x}$$



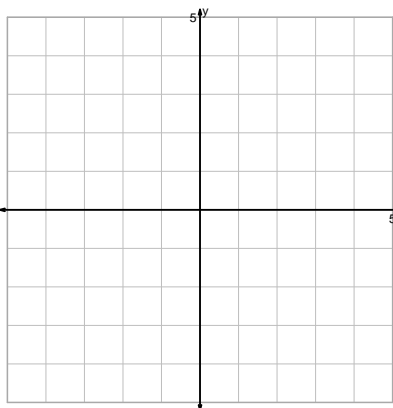
$$y = \sqrt{x} + 2$$



$$y = \frac{\log_2(x)}{2}$$

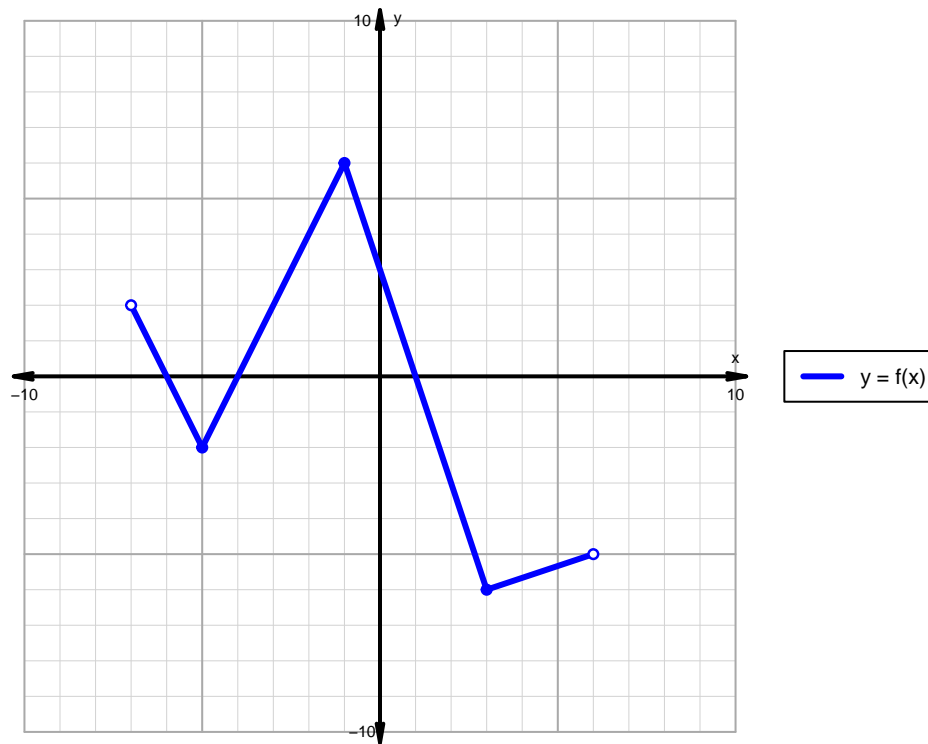


$$y = (x + 2)^2$$



Question 3 (20 points)

A function is graphed below.



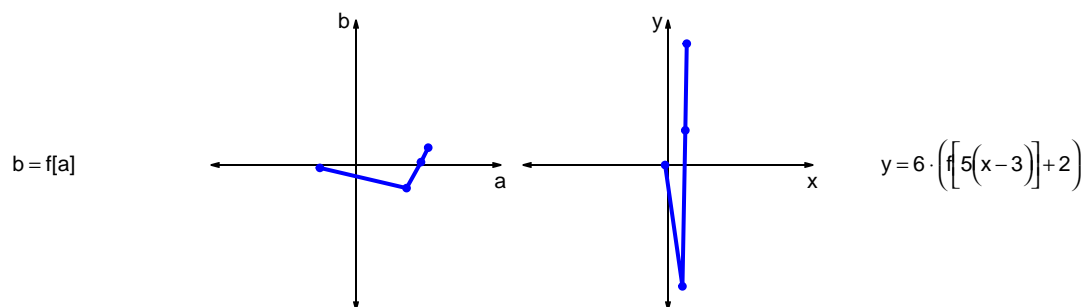
Indicate the following intervals using interval notation.

Feature	Where
Positive	
Negative	
Increasing	
Decreasing	
Domain	
Range	

Question 4 (20 points)

Let f represent a function. The curves $b = f[a]$ and $y = 6 \cdot (f[5(x - 3)] + 2)$ are represented below in a table and on graphs.

a	b	x	y
-25	-2	-2	0
35	-16	10	-84
45	2	12	24
50	12	13	84



- Write formulas for calculating x from a and calculating y from b . (Or, write the coordinate transformation formula.)
- What geometric transformations (using words like translation, stretch, and shrink), and in what order, would transform the first curve $y = f[x]$ into the second curve $y = 6 \cdot (f[5(x - 3)] + 2)$?

Question 5 (10 points)

A parent square-root function is transformed in the following ways:

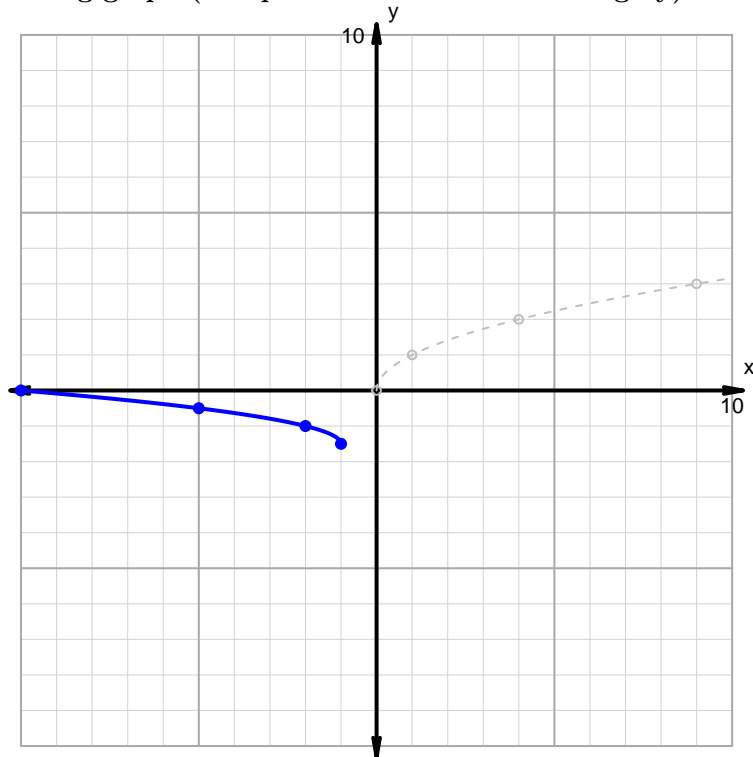
Horizontal transformations

1. Translate right by distance 1.
2. Horizontal reflection over y axis.

Vertical transformations

1. Translate down by distance 3.
2. Vertical shrink by factor 2.

Resulting graph (and parent function in dashed grey):



- What is the equation for the curve shown above?

Question 6 (20 points)

Make an accurate graph, and describe locations of features.

$$y = -3 \cdot |x - 4| + 9$$



Feature	Where
Domain	
Range	
Positive	
Negative	
Increasing	
Decreasing	